

Advanced Optical Metrology for XRAY Replication Mandrels and Mirrors, Phase I

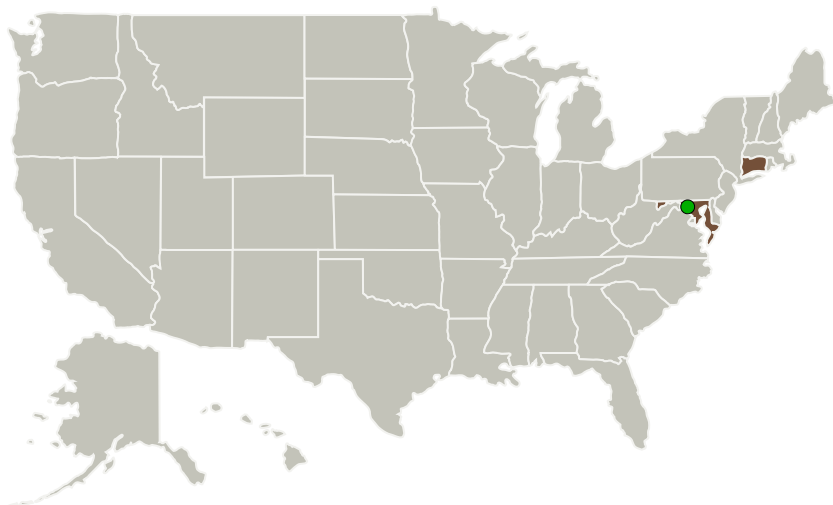
Completed Technology Project (2013 - 2013)



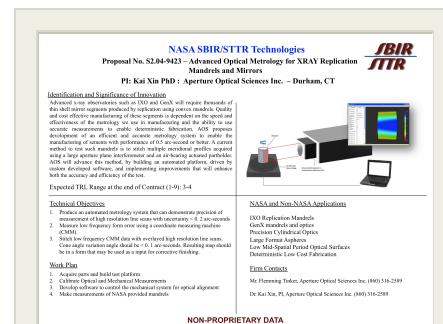
Project Introduction

Advanced x-ray observatories such as IXO and GenX will require thousands of thin shell mirror segments produced by replication using convex mandrels. Quality and cost effective manufacturing of these segments is proportional to the speed and effectiveness of the metrology we use in manufacturing and the ability to use accurate measurements to enable deterministic fabrication. AOS proposes development of an efficient and accurate metrology system to enable the manufacturing of segments with performance of 0.5 arc-second or better. A current method to test such mandrels is to stitch multiple meridional profiles acquired using a large aperture plano interferometer and an air-bearing actuated partholder. AOS will advance this method, by building an automated platform, driven by custom developed software, and implementing improvements that will enhance both the accuracy and efficiency of the test.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Aperture Optical Sciences Inc	Lead Organization	Industry	Durham, Connecticut
 Goddard Space Flight Center (GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Primary U.S. Work Locations

Connecticut

Maryland

Project Transitions

May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137966>)

Images



Project Image

Advanced Optical Metrology for XRAY Replication Mandrels and Mirrors

(<https://techport.nasa.gov/image/133171>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Aperture Optical Sciences Inc

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

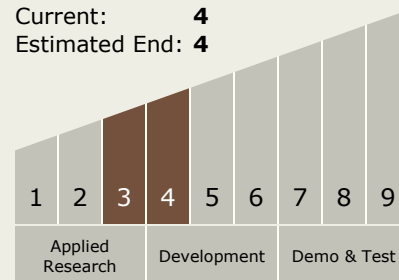
Carlos Torre

Principal Investigator:

Kai Xin

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System